

H. S. Johnson
1928.

Rhodora

JOURNAL OF THE
NEW ENGLAND BOTANICAL CLUB

Conducted and published for the Club, by

BENJAMIN LINCOLN ROBINSON, Editor-in-Chief

MERRITT LYNDON FERNALD }
HOLLIS WEBSTER } Associate Editors
CARROLL WILLIAM DODGE }

WILLIAM PENN RICH, Publication Committee

Vol. 30.

February, 1928.

No. 350.

CONTENTS:

- Geocaulon, a new Genus. American and Asiatic Beckmannia.
A Variety of Polystichum Braunii. *M. L. Fernald* 21
- Notes from Herbarium of Univ. Wisconsin—II. *N. C. Fassett* 31
- Utricularia subulata in Plymouth, Massachusetts. *L. B. Smith* 35
- Two Weeds new to Milton, Massachusetts. *N. T. Kidder* 36
- Exceptional Dimensions in Corydalis sempervirens. *R. J. Eaton* . . 36

Boston, Mass.
300 Massachusetts Ave.



Providence, R. I.
Preston and Rounds Co.

RHODORA.—A monthly journal of botany, devoted primarily to the flora of New England. Price, \$2.00 per year, postpaid (domestic and foreign); single copies (if available) 20 cents. Volumes 1–8 or single numbers from them can be supplied at somewhat advanced prices which will be furnished on application. Notes and short scientific papers, relating directly or indirectly to the plants of the northeastern states, will be gladly received and published to the extent that the limited space of the journal permits. Forms will be closed five weeks in advance of publication. Authors (of more than one page of print) will receive 25 copies of the issue in which their contributions appear. Extracted reprints, if ordered in advance, will be furnished at cost.

Address manuscripts and proofs to

B. L. ROBINSON, 3 Clement Circle, Cambridge, Mass.

Subscriptions, advertisements, and business communications to

W. P. RICH, 300 Massachusetts Avenue, Boston, Mass.

Entered at Boston, Mass., Post Office as Second Class Mail Matter.

BOTANICAL BOOKS,

New and Second Hand,

PRESTON & ROUNDS CO.,

Providence, R. I.

CARD-INDEX OF NEW GENERA, SPECIES AND VARIETIES OF AMERICAN PLANTS, 1885 TO DATE.

For American taxonomists and all students of American plants the most important supplement to the Index Kewensis, this catalogue in several ways exceeds the latter work in detail, since it lists not only the flowering plants, but pteridophytes and cellular cryptogams, and includes not merely genera and species, but likewise subspecies, varieties and forms. A work of reference invaluable for larger herbaria, leading libraries, academies of sciences, and other centers of botanical activity. Issued quarterly, at \$22.50 per 1000 cards.

GRAY HERBARIUM of Harvard University,

Cambridge, Mass., U. S. A.

CHECK LIST OF GRAY'S MANUAL, 7th EDITION, compiled by M. A. DAY. Leatherette. Pocket size. Invaluable for collector's memoranda and herbarium records. Published and sold by the GRAY HERBARIUM, Cambridge, Mass. Price postpaid 20 cts. each. Ten copies \$1.50.

MEMOIRS OF THE GRAY HERBARIUM. A series of illustrated quarto papers issued at irregular intervals, sold separately.

Vol. II. Persistence of Plants in unglaciated Areas of Boreal America, by M. L. Fernald, 102 pages. Aug. 1925. \$2.00

Gray Herbarium of Harvard University, Cambridge, Mass.

Advertisements of Nurserymen and Dealers in Botanical and other Scientific Publications are inserted in these pages at the following rates per space of 4 in. by 3-4 in. 1 year \$4.00, 6 months \$2.50.

Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 30.

February, 1928.

No. 350.

CONTRIBUTIONS FROM THE GRAY HERBARIUM OF HARVARD UNIVERSITY,—NO. LXXIX.

M. L. FERNALD

I. GEOCAULON, A NEW GENUS OF THE SANTALACEAE

EVER since I first met *Comandra livida* Richardson, in 1894, I have had a strong conviction that it is out of place in the genus *Comandra* Nutt. Many times subsequently in the field, as I have gathered the juicy scarlet false-drupes from the filiform axillary peduncles or have examined the bronze or green, often unisexual, flowers, I have made a mental protest against the inclusion of this plant of the moss and damp humus in the same genus with *Comandra umbellata* (L.) Nutt. or with *C. elegans* (Rochel) Reichenb. f. Finally, in August, 1923, with the intention of settling the question, an abundant series of inflorescences was collected on the Shickshock Mountains; but not until the present time have they been closely studied. It now becomes quite clear that in essentially all its characters *C. livida* departs from all the species of *Comandra* proper: *C. umbellata* (L.) Nutt., *C. Richardsiana* Fernald, *C. pallida* A.DC., *C. elegans* (Rochel) Reichenb. f., *C. californica* Eastw., and perhaps others.

In true *Comandra* the stoutish creeping or sprawling superficial or subterranean stems or rootstocks are covered with a loose and freely exfoliating corky to papery whitish-brown cortex; in *C. livida* the very slender and cord-like reddish to dark-brown subterranean stems have a tight and smooth cortex. In true *Comandra* the inflorescences are terminal panicles or corymbs of numerous small umbels, each umbel subtended by a tardily deciduous or persistent foliaceous involucrel; in *C. livida* the 1-3 simple mostly 3-flowered umbels are borne on

filiform peduncles from the axils of the middle leaves, and the brown, scarious involucre is caducous. The flowers of true *Comandra* are perfect, the calyx-tube free from the summit of the ovary and in fruit slightly prolonged as a neck; and the ascending turbinate limb consists of petaloid whitish lobes. The flowers of *C. livida* are androdioecious, the central 1 (rarely 2) perfect, the lateral mostly staminate and promptly dropping after anthesis, or sometimes all the flowers staminate; the calyx-tube is completely adnate to the ovary, not prolonged above it, and the rotate limb consists of bronze or green herbaceous lobes. In true *Comandra* the elongate disk is shallowly lobed, its lobes much shorter than the filaments, and it reaches the summit of the prolonged tube; in *C. livida* the salverform disk arises from the base of the throat and its long lobes about equal the filaments. In true *Comandra* the style is filiform and prolonged; in *C. livida* conical and very short. Finally, the fruit of true *Comandra* is a dry nut with only the lower half or two-thirds of the coriaceous calyx-tube adherent to it, the upper portion forming a free neck below the erect lobes; in *C. livida* the fruit is a scarlet and juicy false-drupe, with the succulent calyx-tube completely surrounding the nut.

Differing in every fundamental character (of rootstock, flowering habit, involucre, fertility of flowers, shape and texture of perianth, adnation of tube, position and lobing of disk, form and length of style, and, above all, in the very different fruit), and restricted to the Hudsonian to arctic-alpine regions of North America, *Comandra livida* does not seem to be congeneric with the species of true *Comandra*, plants of more southern range in America, with an isolated species in southeastern Europe.

In many characters *Comandra livida* is much closer to the monotypic *Nestronia* (or *Darbya*) of the southeastern United States. Like staminate *Nestronia umbellula* Raf., *Comandra livida* has the simple few-flowered umbels on filiform axillary peduncles, borne always below the terminal leaves, the involucre bracts caducous (in all material of *Nestronia* examined completely absent), and the calyx herbaceous and with spreading limb. The pistillate or perfect flower of *Nestronia*, like that of *Comandra livida*, has the ovary quite inferior and ripening into a false-drupe with completely adnate calyx-tube. But in many characters *Comandra livida* departs from *Nestronia*. The latter is a branching shrub, with opposite leaves; *C. livida* at most suffrutescent, with simple herbaceous flowering stems and

alternate leaves. *Nestronia* is dioecious or polygamo-dioecious, the pistillate flowers solitary (not umbellate) and with the limb a mere crown; *C. livida* with the perfect flower central in the umbel with the staminate and with a spreading limb. In *Nestronia* the calyx-lobes are normally 4, in *C. livida* 5; in *Nestronia* the calyx-tube of the staminate flower is elongate and lined by the elongate, shallowly lobed or undulate disk; in *C. livida* short-campanulate or salverform, with the lobes of the disk prolonged.

It is thus clear that in some of its technical characters *Comandra livida* is nearer *Nestronia* than it is to *Comandra*; yet it is not satisfactorily placed with either. It is, therefore, here proposed as

***Geocaulon* (*Santalaceae*), gen. nov.** Flores andro-dioici, centrales plerumque hermaphroditi, laterales masculi. Calyces herbacei, priores et masculi inferne turbinato, feminei campanulati; lobis ovato-acutis, aeneis vel viridibus, patentibus persistentibusque. Fasciculus pilorum e basi interna lobi cujusve ad antheram tendens ubique adhaerens. Stamina lobis opposita, filamento subulato, anthera ovoidea, biloculari. Discus epigynus hypocateriformis, lobis elongatis filamenta subaequantibus. Ovarium inferum, tubo calycis inclusum. Stylus conicus, brevis. Stigma capitellatum. Drupa ovoideo-globosa coccinea, vestigiis loborum et disci coronata.—Fruticulus caulibus sarmentiformibus, valde repentibus, brunneis vel rufescentibus; ramis floriferis erectis; foliis alternis integris; umbella solitaria axillaris pedunculata 3 (2–4)-flora; bracteis involucri scariosis brunneis caducis; floribus masculis caducis. (Γῆ, *earth*, and κάλος, *stalk*, from the long, slightly subterranean but scarcely modified stems.)—A single species.

***G. lividum* (Richardson), n. comb.** *Comandra livida* Richardson in Frankl. Narr. 1st Journ. App. 734 (1823).—Creeping stems very slender, 1.5–3 mm. thick, with close smooth cortex; flowering stems 0.7–3 dm. high: leaves flaccid, grayish-green to purplish, elliptic to narrowly obovate, 1.5–5 cm. long: peduncles 1–3, filiform, in fruit 1–2 cm. long: limb of perianth about 4 mm. broad: drupes solitary (rarely 2), 6–10 mm. in diameter, with juicy pulp; the stone (or nut) thin-walled, with a very fleshy and oily edible kernel.—Creeping in moss or damp humus, Labrador to Alaska, south to southern New Brunswick, eastern Maine, mountains of northern New England, northern Michigan, northern Minnesota, Saskatchewan, Alberta and British Columbia. Fl. late May–early August; fr. July–September. The following, selected from many specimens, are characteristic. LABRADOR: Makkovik, *Stecker*, no. 99; Hopedale, *Bowdoin College Exped.* no. 245; Square Island, 1864, *B. P. Mann*; Chateau Bay, *Bowdoin College Exped.* no. 75; Forteau, *Fernald & Wiegand*, no. 3284. NEWFOUNDLAND: Burnt Cape, *Fernald, Wiegand, Pease, Long, Griscom, Gilbert & Hotchkiss*, no. 28,113; Mistaken Cove, *Wiegand, Pease, Long & Hotchkiss*, no. 28,112; Brig Bay, *Fernald, Long & Dunbar*,

no. 26,610; Deer Pond, *Wiegand, Gilbert & Hotchkiss*, no. 28,114; Port Saunders, *Fernald & Wiegand*, no. 3283; Bay of Islands, *Eames & Godfrey*, no. 6037; Sandy Lake, *Fernald & Wiegand*, no. 3282; Grand Falls, *Fernald, Wiegand, Bartram & Darlington*, nos. 5327, 5328; Tilt Cove, *Fernald & Wiegand*, no. 5331; St. John's, *Robinson & Schrenk*, no. 152. QUEBEC: Archipel du Petit Mécatina, *St. John*, no. 90,397; Ile à la Proie, Archipel de Mingan, *Victorin & Rolland*, nos. 18,506, 22,055; Baie Sainte-Claire, Anticosti, *Victorin*, no. 4270; Seven Islands, *C. B. Robinson*, no. 731; La Péninsule, Baie de Gaspé, *Victorin et al.* no. 17,331; Tabletop Mts., Gaspé Co., *Fernald, Dodge & Smith*, no. 25,713; New Carlisle, 1902, *Williams & Fernald*; Lac Saint-Jean, *Victorin*, no. 15,754; Tadousac, 1892, *Kennedy*; Rivière du Loup, *Victorin*, no. 134; St. Alexandre de Kamouraska, 1880, *Pringle*; Black Lake, *Fernald & Jackson*, no. 12,077. MAGDALEN ISLANDS: Brion Island, *St. John*, no. 1851. NEW BRUNSWICK: St. John, 1872, *T. P. James*. MAINE: Mt. Katahdin, 1900, *Fernald*; Mt. Saddleback, Franklin Co., 1894, *Fernald*, 1902, *Knowlton*; Mt. Abraham, *Knowlton*, no. 606; West Quoddy Head, Lubec, *Fernald*, no. 1715; Roque Bluffs, 1913, *Knowlton*. NEW HAMPSHIRE: Mt. Clinton, *Eggleston*, no. 2399, *Pease*, no. 12,303; Imp Mt., *Pease*, no. 16,766; Mt. Ingalls, *A. H. Moore*, no. 4096, *Pease*, no. 11,210. VERMONT: Mt. Mansfield, *Pringle et al.* ONTARIO: Pic River, *Loring*; Anvil Lake, Timagami Region, *Anderson & Anderson*, no. 26,100. MICHIGAN: Isle Royale, 1849, *Whitney*; Keweenaw Co., 1863, *Robbins*; Marquette Island, 1913, *W. H. Manning*. MINNESOTA: border of Lake of the Woods, south of 49°, *Richardson*. MANITOBA: Churchill, *J. M. Macoun*, no. 79,398; Lake Manitoba, 1881, *Macoun*. SASKATCHEWAN. 1857-8, *Bourgeau*. ALBERTA: Rocky Mts., *Drummond*; Banff, *Canby et al.* BRITISH COLUMBIA: Macleod's Lake, lat. 55°, *Macoun*, no. 1559; Revelstoke, *Shaw*, no. 31. YUKON: Dawson, *Eastwood*, nos. 117, 491. ALASKA: Lake Iliamna Region, *Gorman*, no. 174.

Geocaulon lividum was beautifully illustrated, as *Comandra livida*, in Hooker, *Flora Boreali-Americana*, t. clxxix B. Although the accompanying description indicates no difference between the central and lateral flowers, the artist noted the difference and showed the central perfect flower much larger than the others.

II. THE AMERICAN AND EASTERN ASIATIC BECKMANNIA

It has often been pointed out that the plant of northwestern North America and northeastern Asia which has passed as *Beckmannia erucaeformis* (L.) Host is not identical with the true *B. erucaeformis* (*Phalaris erucaeformis* L.) of southeastern Europe and southwestern Asia; but not until Hultén's recent scholarly publication upon the

flora of Kamtchatka¹ have the two plants been adequately contrasted. Hultén shows that there are two quite distinct species of *Beckmannia*.² True *B. erucaeformis* of Italy, Greece, Hungary, southern Russia and Asia Minor is a perennial with bulbous or "incrassated" bases, simple or but slightly compound and very short panicle-branches closely appressed to the rachis: spikelets mostly 2-flowered and strongly rounded; the glumes nearly semicircular, coriaceous and with a rounded keel and very narrow membranaceous border; the thick lemma short-mucronate or very short-pointed, scabrous and beset with long hairs along the median nerve. The plant of northeastern Asia and northwestern America, on the other hand, has the culms with soft bases, usually described as annual, commonly coarser and taller; the leaves broader; the panicle much more branched, with the principal branches longer and somewhat spreading; spikelets larger, mostly with 1 perfect and 1 aborted floret, pyriform; glumes rounded-triangular, broadest toward the apex, thin, strongly carinate, with a whitish scarious border; lemma thin, long-mucronate, glabrous or only slightly short-pilose on the dorsal nerve. For this plant of eastern Asia Hultén proposes the name *Beckmannia baicalensis* (W. Kuznetzow) Hultén,³ based upon *B. erucaeformis*, var. *baicalensis* W. Kuznetzow (1913).

Hultén gives a careful discussion of the two plants and makes a good case for the specific segregation of *B. baicalensis*; but, unfortunately, he overlooked at least two available names which were published earlier than Kuznetzow's in 1913. In order clearly to understand these names it is well to start with the original *Phalaris erucaeformis* L.⁴ Linnaeus did not differentiate the two and certainly included them both under *P. erucaeformis* which had its "*Habitat in Sibiria, Russia, Europa australi*." After a brief original diagnosis, "PHALARIS panicula lineari secunda, calycibus bifloris," which certainly applies to the plant from "Russia, Europa australi," he gave three citations: "Dactylis spicis numerosis alternis culmo adpressis longitudine internodiorum, calycibus bifloris. Roy. lugdb.

¹ Eric Hultén, *Flora of Kamtchatka and the Adjacent Islands*, i,—Kungl. Svenska Vetenskapsakad. Handl. Ser. 3, v. no. 1 (1927).

² In some of our American manuals we are told that the genus was named "In honor of Johann Beckmann, . . . teacher of Natural History at St. Petersburg." The original statement of Host, however, was: "Hoc proprii generis gramin in honorem Cl. viri Joannis Beckmanni, in Universitate Goettingensi Oeconomiae ruralis Professoris, nominavi"—Host, Ic. Gram. Austr. iii. 6 (1805).

³ Hultén, l. c. 119 (1927).

⁴ L. Sp. Pl. i. 55 (1753).

57. *Gmel. sibir. I. p. 130. t. 29*" and "*Gramen palustre, locustis erucaeformibus. Barr. rar. 1158. t. 2.*" Royen's description and his citation of the description and plate of Barreliero show that he had the Italian plant and although Barreliero said of the plant "*Annum est,*"¹ he certainly had the plant of Italy, and the Linnean specific name was obviously derived from his *Gramen palustre, locustis Erucaeformibus*, a name given from the resemblance of the green spikes to caterpillars on the branches of a tree. Linnaeus's reference to Gmelin's Siberian plant alone belongs to *Beckmannia baicalensis*. Gmelin's plate is thoroughly typical for the latter species. With Linnaeus's own diagnosis and the plants of Royen and of Barreliero coinciding, and with the specific name clearly derived from Barreliero's account of the Italian plant, there can be no doubt that the name *B. erucaeformis* should be restricted to the plant of southeastern Europe and Asia Minor. The species is well illustrated in Host, *Ic. Gram. Austr. iii. t. 206* (1805); Nees, *Gen. i.t. 40* (1843) and Reichenbach, *Ic. Fl. Germ. i. t. clxxi* (1850).

That the wide-ranging northern plant is not identical with the Mediterranean species seems to have been first recognized by Steudel in 1846. Receiving the plant from Japan, Steudel, on account of the single perfect flower, the disarticulation of the spikelets below the glumes and the superficial resemblance of the plant to *Panicum bri-zoides* Jacq. and others with the inflorescence of *Echinochloa*, described it as *Panicum Syzigachne*.² Later, however, recognizing that his Japanese species belonged to *Beckmannia*, he reduced it to a variety of *B. erucaeformis*, "*Variat: statura et omnibus partibus majoribus. Panicum Syzigachne. Steud. Flora 1846. p. 19. Japon.*"³ In 1880 Dr. George Thurber, treating the grasses of California and retaining our plant as *B. erucaeformis*, made the note: "*In all American specimens we have thus far examined the upper floret is wanting.*"⁴ Thurber's observation was soon again emphasized by Vasey, who, in diagnosing *Beckmannia*, described the spikelets as "*consisting of two perfect flowers, the terminal one only fertile, (or in American specimens the lower flower is suppressed);*" and at the same time Vasey called the American plant *B. erucaeformis*, var. *uniflorus* Scribn.,⁵ but without diagnosis further than by implication from the

¹ Barr. *Plantae per Galliam, Hispaniam et Italiam Observatae*, 105 (1714).

² Steud. *Flora*, xxix. 19 (1846).

³ Steud. *Syn. Pl. Gram.* 15 (1854).

⁴ Thurber in Wats. *Bot. Cal. ii.* 264 (1880).

⁵ Scribn. in Vasey, *Descr. Cat. Grasses U. S.* 8 (1885).

preceding note. In 1896 *B. erucaeformis uniflorus* Scribn. was used by Beal¹ for the American plant which was well described and illustrated by drawings of the spikelet supplied by Scribner; and in the 6th edition of Gray's *Manual*, Watson & Coulter took up *B. erucaeformis*, var. *uniflora*, a name dropped by Hitchcock from the 7th edition, where the plant is treated unequivocally as *B. erucaeformis*, although the genus, based upon a 2-flowered species, was by Hitchcock now defined as having "Spikelets 1-flowered in our species." In his later work the American and Asiatic plant is still maintained by Hitchcock as *B. erucaeformis* (without var. *uniflora* cited as a synonym); but the facts of the case are covered by the statement under the generic description: "Spikelets 1-flowered, rarely 2-flowered";² and under the specific description: "The European form has 2-flowered spikelets."² In 1913, W. Kuznetzow again named the Asiatic and American plant, his material coming from Transbaikalia, whence his new name *B. erucaeformis*, var. *baicalensis*,³ upon which Hultén based the specific combination *B. baicalensis*. In taking up Kuznetzow's varietal name as the specific name for a plant which extends half way around the northern hemisphere Hultén was apologetic: "Although his variety name is not very suitable for the species, I have thought it most correct to retain it" (p. 121). Unfortunately, however, correct following of nomenclatorial rules forces us to use for the species a name in some ways less desirable than *B. baicalensis*. The correct name of the plant seems to be

BECKMANNIA *Syzigachne* (Steud.), n. comb. *Panicum Syzigachne* Steud. *Flora*, xxix. 19 (1846). *B. erucaeformis*, var. Steud. *Syn. Pl. Gram.* 15 (1854). *B. erucaeformis*, var. *uniflorus* Scribn. in Vasey, *Descr. Cat. Grasses U. S.* 8 (1885), name only; in Beal, *Grasses N. A.* ii. 428, fig. 77 (1896). *B. erucaeformis*, var. *baicalensis* W. Kuznetzow, *Bull. Angev. Bot.* vi. No. 9: 584 (1913). *B. baicalensis* (W. Kuznetzow) Hultén, *Kungl. Svenska Vetenskapsakad. Handl. Ser. 3*, v. no. 1: 119 (1927).

Beckmannia Syzigachne, as previously stated, was well illustrated by Gmelin. Scribner's figures of the spikelet of his *B. erucaeformis*, var. *uniflorus* are excellent, and Mrs. Chase's illustration (as *B. erucaeformis*) in Hitchcock, *Gen. Grasses U. S.* fig. 108 is very characteristic.

¹ Beal, *Grasses*, N. A. ii. 428, fig. 77 (1896).

² Hitchc. *Gen. Grasses U. S.* 180, 182 (1920).

³ W. Kuznetzow, *Bull. Angev. Bot.* vi. No. 9: 584 (1913).*

III. THE EASTERN AMERICAN VARIETY OF *POLYSTICHUM*
BRAUNII

(Plate 159)

THE plant which has been passing in eastern America as *Polystichum Braunii* (Spenner) Fée abounds in rich woodlands and glades or on shaded talus and rock-slides of northern and western Newfoundland, Anticosti Island and the Gaspé Peninsula of Quebec. Westward and southward it becomes more local, extending west to Algoma District, Ontario and south (at low altitudes) to Cape Breton Island and Colchester and Kings Counties, Nova Scotia and Charlotte County, New Brunswick, and (chiefly in the mountains) to Aroostook, northern Penobscot, northern Piscataquis, northern Somerset and Franklin Counties, Maine, Carroll and Grafton Counties, New Hampshire, Berkshire County, Massachusetts, Ulster and Delaware Counties, New York, Sullivan County, Pennsylvania and Keweenaw County, Michigan. It is thus completely isolated from *P. Braunii* of Europe, which is there a plant of decidedly southern range: localized in upland woods of the Caucasus and southern Russia, and from the Transylvanian and Croatian Alps to the Maritime Alps and the Pyrenees, extending northward in the mountains to southern Germany, where (according to Milde) it is abundant in some regions of Silesia. North of southern Germany it is found at two stations in southernmost Sweden and at scattered stations in southern Norway, thence extending to a point (Brönnö) about midway along the western coast of Norway. It is not in arctic Europe, nor does it reach the British Isles, Iceland and Greenland; and the plant of eastern America does not extend north of the St. Lawrence basin, being decidedly a Canadian type. Outside Europe, *P. Braunii* is known in Eurasia only in northeastern Asia, whence it apparently extends across into southern Alaska. The Japanese plant is at least varietally distinct, var. *japonicum* Christ; and in Alaska there is a related plant, *P. alaskense* Maxon, which in its more attenuate pinnae and more tapering bases of the pinnules closely simulates the Kamtchatkan *P. Braunii*, var. *kamtschaticum* C. Chr. & Hultén, Kungl. Vet. Akad. Handl. v. no. 1: 38, t. 2 (1927), but its fronds are simply bipinnate, those of var. *kamtschaticum* tripinnatifid. European authors are in the habit of citing the Hawaiian Islands as also having *P. Braunii*, but the Hawaiian plants, *P. haleakalense* Brack. and *P. Hillebrandii* Carruth., are thoroughly distinct in many obvious characters. The Alaskan

material which may belong to *P. Braunii* is fragmentary and its identity, therefore, not readily settled, and at least some of the plants of eastern Asia are more like the eastern American than the European plant.

The plant of the Canadian forest of southeastern Canada and the northeastern states, unknown on the Labrador Peninsula or in Greenland, has obviously been long isolated from the European plant, unknown in arctic Europe, the British Isles and Iceland. As a general rule, flowering plants with such ranges would be found to have quite definite characters of flower and fruit and would stand as good species: such pairs as *Carex loliacea* L. (Eu., e. Asia and n.w. Am.) and *C. trisperma* Dew. (Atl. N.A.), *C. alba* Scop. (Eu., e. Asia) and *C. eburnea* Boott (Atl. N. A.), *Luzula pilosa* (L.) Willd. (Eu. and w. Asia) and *L. saltuensis* Fern. (Atl. N.A.), *Hepatica nobilis* Schreb. (Eu.) and *H. americana* (DC.) Ker. (Atl. N.A.), etc., etc.; but, although showing recognizable, though slight, differences in the scales of the stipe and rachis, in the texture of the frond and the toothing of the pinnules, the American and European plants have essentially identical spores.

P. Braunii of Europe is generally described as having herbaceous fronds: "Blätter . . . weich . . . nicht überwinternd"—Luerssen; "Textur krautig"—Christ; "*Fronde*s . . . seulement *membraneuses*"—Rouy; but in the plant of eastern America they are subcoriaceous. Consequently, in the European plant the venation of the pinnules is distinctly seen under low magnification; in the American ordinarily it is rather obscure. The largest scales of the stipe-bases in the European plant are rather firm and are prolonged into bristle-tips 5–8 mm. long; in the eastern American they are much thinner and shorter-pointed (the bristle-tip 1–4 mm. long). Under considerable magnification the median cells of the large scales of the European plant appear elongate-linear, with heavy cell-walls and extremely narrow lumina; while in the eastern American plant the thinner scales show shorter-linear to oblong cells (mostly 100–300 μ long) with very thin walls and broad lumina, a difference similar to that separating the European *Thelypteris spinulosa*, var. *dilatata* (Hoffm.) St. John and the American var. *americana* (Fischer) Weatherby. In the European plant the back of the rachis (especially the lower half) bears innumerable retrorse soft acicular scales which are far more numerous than the lanceolate scales; in the eastern American plant the relation is

reversed, the lanceolate scales being more abundant than in the European, the acicular scales fewer and shorter. In the European plant the terminal (and often the marginal) bristles of the pinnules are 1-2 mm. long; in the plant of eastern America 0.5-1.3 mm. long. Only a few good indusia of the European plant have been available for study, consequently it has not been possible to make a satisfactory comparison of this organ in the two plants; but, as stated, the spores present no appreciable difference unless it is that the American are minutely larger.

With essentially identical spores and outline of frond, pinnae and pinnules, the two plants illustrate the conservatism of the ferns. They have obviously been long isolated but their segregation has proceeded only far enough to affect the superficial vegetative characters. These, however, are sufficient to make it clarifying to distinguish the eastern American (and northern Chinese) plant as a geographic variety; and since the first American record of the plant was based upon its discovery by Frederick Pursh in the Green Mountains of Vermont in 1807 it is appropriate that it be called

POLYSTICHUM BRAUNII (Spenner) Fée, var. **Purshii**, n. var., forma typica recedit frondibus subcoriaceis; stipitis squamis scariosis latissimis acutis vel breviter aristatis, arista 1-4 mm. longa, cellulis mediis oblongis vel linearibus 100-300 μ longis lumine lato parietibus tenuibus pallidis; rhacheos squamis lanceolatis fibrillosisque illis pluribus; pinnularum aristis terminalibus 0.5-1.3 mm. longis.—Cool woods, glades and shaded talus, northern and western Newfoundland, Anticosti Island and Gaspé Peninsula, Quebec to Algoma District, Ontario, south to Cape Breton and Colchester and Kings Counties, Nova Scotia, York and Charlotte Counties, New Brunswick, Aroostook, northern Penobscot, northern Piscataquis, northern Somerset and Franklin Counties, Maine, Carroll and Grafton Counties, New Hampshire, Berkshire County, Massachusetts, Ulster and Delaware Counties, New York, Sullivan County, Pennsylvania and Keweenaw County, Michigan; southward chiefly at altitudes from 300-1525 m. (1000-5000 feet); also northern China and Sachalin Island. TYPE: Smuggler's Notch, Vermont, August 9, 1877, *C. E. Faxon* (in Gray Herb.), distributed as *Aspidium aculeatum*, var. *Braunii*.

This is the plant which has regularly passed in eastern America as *Aspidium aculeatum*, *A. aculeatum*, var. *Braunii*, *Polystichum aculeatum*, var. *Braunii* and *Polystichum Braunii*.

EXPLANATION OF PLATE 159

POLYSTICHUM BRAUNII, var. *PURSHII*. A small plant, $\times \frac{1}{3}$, from Colebrook, New Hampshire, *Pease*, no. 10,387. Photograph by *Professor J. F. Collins*.

(To be continued)



POLYSTICHUM BRAUNII, VAR. PURSHII, $\times \frac{1}{3}$

NOTES FROM THE HERBARIUM OF THE UNIVERSITY OF WISCONSIN—II.

BIDENS CONNATA AND ITS VARIETIES IN WISCONSIN

NORMAN C. FASSETT

(Plate 160)

IN his key to the northeastern American species of *Bidens*¹ the writer distinguished *Bidens connata* and its allies, *B. bidentoides*, *B. Eatoni*, *B. multiceps*, and *B. heterodoxa*, as having the "margins of the achenes antorsely barbed, at least at the very base." Some of the achenes do not show this. A more constant character seems to be in the hairs on the surfaces of the achene, which are antrorse, as opposed to the retrorse hairs (or none) on the surfaces of the achenes of *B. laevis*, *B. cernua*, *B. hyperborea*, *B. comosa*, and *B. tripartita*.

The following arrangement of the variations of *Bidens connata* is based on material in the Herbarium of the University of Wisconsin, on the collections of L. M. Umbach recently acquired from North-Central College, material from the Milwaukee Public Museum made available through the courtesy of Dr. H. H. Smith, and material of *B. connata*, var. *pinnata*, kindly loaned from the Herbarium of the University of Minnesota by Professor C. O. Rosendahl.

As it grows in Wisconsin *B. connata* falls into six varieties, as follows:

- a. Middle and lower leaves undivided, from coarsely dentate to deeply cleft into 3 broadly lanceolate divisions—b.
- b. Margins of achenes retrorsely barbed, except sometimes at base—c.
- c. Petioles winged: achenes seldom exceeding 6.5 mm. in length: leaves often 3-cleft—d.
- d. Outer involucrel bracts seldom exceeding 1.5 cm. in length.....var. *typica*
- d. Outer involucrel bracts 3-6 cm. in length.....var. *fallax*
- c. Petioles narrowly margined: inner achenes 7-8 mm. long: leaves rarely 2-3-cleft.....var. *petiolata*
- b. Margins of achenes with at least some antrorse barbs toward the summit—e.
- e. Awns with antrorse and retrorse barbs intermixed....var. *ambiversa*
- e. Awns entirely antorsely barbed.....var. *anomala*
- a. Middle and lower leaves pinnately 3-7-parted, the divisions narrowly lanceolate.....var. *pinnata*

B. CONNATA, var. **typica**. *B. connata* Muhl. in Willd. Sp. iii. 1718 (1804); Fernald, RHODORA x. 200 (1908); not Farwell, Ann. Rep. Comm. Parks & Boulevards Detroit xi. 91 (1900). Following Nuttall, Professor Fernald distinguished *B. connata* from its var. *petiolata* on

¹ RHODORA xxvii 184-185 (1925).

the basis of the winged petioles and lobed leaves of the former. Some years later, in RHODORA xvii. 243 (1915), R. W. Woodward pointed out the fact that the achene of var. *petiolata* is larger than that of typical *B. connata*. This achene difference was again emphasized by Fernald in RHODORA xxi. 103 (1919) by the statement that *B. connata* has outer achenes 4–5.3 mm. long, and inner achenes 5–6.5 mm. long, while its variety has outer achenes 6.5 mm. long, and inner achenes up to 8 mm. long.

A number of plants in the Herbarium of the University of Wisconsin have unlobed leaves and short achenes. A study in the field revealed, on the sandy shore of Golden Lake, near Dousman, Wisconsin, plants (Fig. 2) which are almost a perfect match for the material of typical *B. connata* collected by Fernald & Weatherby at Winchester, Massachusetts, in September, 1908, and distributed as *Plantae Exsiccatae Grayanae* no. 298. Growing with this form at Dousman, and obviously grading into it, was a plant also with short achenes, but with unlobed leaves and winged petioles (Fig. 1). It appears, then, that var. *typica* may have uncleft leaves, and that the short achenes and winged petioles are more constant characters than is the lobing of the leaf-blade.

B. connata, var. *typica*, is apparently widely distributed in Wisconsin.

B. connata, var. *FALLAX* (Warnst.) Sherff, Bot. Gaz. lxxvi. 154 (1923). *B. connata*, var. *fultior* Fernald & St. John, RHODORA xvii. 24 (1915). This variety, to judge from Wisconsin material, is an offshoot from var. *typica*, for its achenes do not exceed 6.5 mm. in length, the petioles are winged, and the leaves are often 3-cleft. Sherff, *l.c.*, declares that the original material of var. *fultior* has 3-cleft leaves. In Wisconsin, var. *fallax* grades into var. *typica*, although some individuals are well marked with bracts 6 cm. long. The few large irregular teeth of the leaves, mentioned both by Fernald & St. John and by Sherff, do not seem to be characteristic of most Wisconsin plants.

The range of this variety in Wisconsin is as follows: POLK Co.: quaking bog, margin of Deer Lake, St. Croix Falls, September 5, 1927, *N. C. Fassett & L. R. Wilson*, no. 4260; sunny bank of a brook, Interstate Park, St. Croix Falls, September 3, 1927, *N. C. Fassett & L. R. Wilson*, no. 4261; wet woods near Poplar Lake, St. Croix Falls, September 4, 1927, *N. C. Fassett & L. R. Wilson*, no. 4262. BUFFALO Co.: wet shore of Fountain City Slough, Fountain City, September 9, 1926, *N. C. Fassett*, no. 2976; rocky shore of the Mississippi River, Alma, August 23, 1926, *N. C. Fassett*, no. 2888; damp ground near Rohrer's Slough, Cochrane, September 7, 1926, *N. C. Fassett*, no. 2884. LACROSSE Co.: damp ground, French Id., Onalaska, August 22, 1927, *N. C. Fassett*, no. 4263.

In Minnesota, this variety has been found along the Mississippi River bottoms, opposite Alma, Wisconsin.

This plant appears to be of sporadic occurrence in southeastern Massachusetts and southern Connecticut, on Block Island, and on the estuary of the St. Lawrence River. In Wisconsin, however, it is common on the Mississippi River bottoms. We must at least consider the possibility (particularly in view of the German population of this region) that its introduction into Germany (see Sherff, *l.c.*) was not from the East, but from Wisconsin.

B. CONNATA, var. *PETIOLATA* (Nutt.) Farwell, *l.c.*, as to name-bringing synonym, but not as to plant; Fernald, *l.c.* *B. petiolata* Nutt. Journ. Acad. Nat. Sci. Phila. vii. pt. 1, 99 (1834). This plant seems best distinguished by its large achenes and wingless or narrowly margined petioles. Bordering shady pools at the State Fish Hatchery near Madison, Wisconsin, the writer found a form of this variety with ovate leaf-blades reaching 4.5 cm. in breadth, scarcely margined petioles reaching 5 cm. in length (Fig. 3), and achenes 8 mm. long. This plant is obviously var. *petiolata*, although it has campanulate heads instead of the cylindrical ones Mr. Woodward found to be characteristic of this variety in Connecticut. These plants were about 4 dm. tall. Growing with them were robust plants reaching a meter in height, with similar heads and achenes, and even larger leaves (the blades 1.8 dm. long and the slender petioles 7 cm. long) whose blades were often 2- or 3-cleft (Fig. 4). But since the pressing of one of these plants in its entirety required four or five sheets, it is obvious why these forms of var. *petiolata* with divided leaves are rare in herbaria. Again, however, the achene and petiole characters corroborate one another, although the cleaving of the leaf-blade proves somewhat inconstant. Even these shade forms, with leaves 7 cm. broad exclusive of the lobes, have petioles whose herbaceous margins barely exceed 1 mm. in breadth, or no more than that of a sun form of var. *typica* whose leaf-blade is but 1.5 cm. broad (Fig. 1). A leaf from a sun form of var. *petiolata* is shown in Fig. 5.

Collections of var. *petiolata* from different parts of Wisconsin indicate that it is of general range in the state.

B. CONNATA, var. *ambiversa*, n. var., planta 3–7 dm. alta subsimplex vel cum ramis tenuibus; foliis mediis 4–7 cm. longis cum dentibus utrinque 1–4 plerumque 3 instructis, quorum inferiores sunt saepe 1.5 cm. longi sinibus paene ad rhachem extendentibus; foliis superioribus saepe simplicibus cum dentibus grossis utrinque 1–4 instructis; bracteis exterioribus 1–3.5 cm. longis linearibus vel lanceolatis; marginibus achaeniis cum sparsis vel copiosis plerumque antrorsis setis instructibus; setis aristarum antrorsis vel retrorsis vel saepe ambobus intermixtis; achaeniis exterioribus planis 5 mm. longis 2–2.5 mm. latis, 2 aristis;

acheniis interioribus 6-8 mm. longis cum 4 angulis ad apicem, 4 aristatis.

Plants 3-7 dm. tall, subsimple or with slender branches: middle leaves 4-7 mm. long, with 1-4, usually 3, long coarse teeth on each side, the lower often reaching 1.5 cm. in length and having a sinus reaching nearly to the midrib (Fig. 6); upper leaves usually not deeply cleft, narrowly lanceolate, with 1-4 coarse teeth on each side; outer foliaceous bracts of the involucre 1-3.5 cm. long, linear to oblanceolate: margins of achenes with sparse to copious, mostly antrorse, hairs; awns with retrorse or antrorse barbs, or commonly with both intermixed (Fig. 7); outer achenes flat, 2-awned, about 5 mm. long and 2-2.5 mm. broad; inner achenes narrowly rhomboidal in cross-section, 4-awned, 6-8 mm. long.—ASHLAND Co.: Sphagnum bog, margin of Loon Lake, Mellen, September 8, 1927, *N. C. Fassett & L. R. Wilson*, no. 5014. ONEIDA Co.: in moist kettle-hole, with copious growth of *Dulichium*, Minocqua, September 14, 1927, *N. C. Fassett*, no. 4257 (TYPE in Herb. Univ. of Wis.); Sphagnum bog, margin of Hill Lake, Minocqua, September 13, 1927, *N. C. Fassett*, no. 4258.

This variety, which is ordinarily distinguished from the next by its peculiarly cut leaves as well as by its achene character, is apparently widely distributed in the Sphagnum bogs of northern Wisconsin.

B. connata, var. *anomala* Farwell, *l.c.* Leaves 5-11 cm. long, undivided or rarely with 2 basal lobes, and with 2-8 teeth on each side; outer bracts of the involucre as in the preceding; awns and margins of achenes antrorsely barbed; achenes apparently of the same size as in the preceding. (Description made from Wisconsin material only.)—ONEIDA Co.: muddy edge of a ditch, "The Narrows," Minocqua, September 14, 1927, *N. C. Fassett*, no. 4259. LANGLADE Co.: White Lake, August 15, 1921, *J. J. Davis*.

B. connata, var. *pinnata* Wats. Gray's Manual, ed. 6: 284 (1899). Plants rather slender, 3-6 dm. tall, usually sparsely, rarely diffusely, branched; lower and middle leaves reaching 9 cm. in length, pinnately parted (Fig. 8), closely simulating those of *B. coronata* (L.) Britton (*B. trichosperma*); the lowermost divisions narrowly linear-lanceolate, rarely exceeding 5 mm. in breadth, entire, or more commonly with 1-5(-7) sharp teeth on each side coming to within 1-2 cm. of the tapering tip; base of each division narrowly decurrent on the petiole; terminal divisions with 2-8 unequal teeth on each side, which become progressively larger toward the base and often grade into the divisions; rhachis and petiole narrowly winged with the decurrent bases of the leaf-divisions: upper leaves undivided, 3-6 cm. long, with 2-10 sharp slender teeth on each side, the leaf-margins between the teeth parallel to the midrib: outer foliaceous bracts of the involucre, on well-developed heads, mostly 1-1.5 cm. long and 1.5-2 mm. broad, oblanceolate: outer achenes 4.5-5 mm. long, 3-awned; inner achenes 6-7 mm. long, 4-awned, the outer pair of awns 2-2.5 mm. long, retrorsely

barbed.—POLK Co.: sandy shore of Poplar Lake, Osceola, September 4, 1927, *N. C. Fassett & L. R. Wilson*, nos. 4016 and 4017. Also in MINNESOTA: HENNEPIN Co.: Minneapolis, July, 1878, *C. H. Herrick*. RAMSEY Co.: White Bear, August, 1890, *J. H. Sandberg*; wet places [no further locality], August, 1891, *J. H. Sandberg*; wet sandy shores [no further locality], August, 1890, *J. H. Sandberg*.

MADISON, WISCONSIN.

EXPLANATION OF PLATE 160

- Figure 1. *B. connata*, var. *typica*, leaf $\times \frac{2}{3}$.
 Figure 2. *B. connata*, var. *typica*, leaf $\times \frac{2}{3}$.
 Figure 3. *B. connata*, var. *petiolata*, leaf $\times \frac{2}{3}$.
 Figure 4. *B. connata*, var. *petiolata*, leaf $\times \frac{2}{3}$.
 Figure 5. *B. connata*, var. *petiolata*, leaf $\times \frac{2}{3}$.
 Figure 6. *B. connata*, var. *ambiversa*, leaf $\times \frac{2}{3}$.
 Figure 7. *B. connata*, var. *ambiversa*, achene $\times 2\frac{1}{2}$.
 Figure 8. *B. connata*, var. *pinnata*, leaf $\times \frac{2}{3}$.

UTRICULARIA SUBULATA IN PLYMOUTH, MASSACHUSETTS.—On September 21, 1927, Mr. H. K. Svenson and I started to investigate some of the numerous small ponds in southern Plymouth just over the Wareham line, in hopes of discovering something novel in this comparatively little worked region. The larger ponds, such as White Island Pond, yielded nothing of interest and several promising areas had been made botanically useless by the construction of cranberry bogs. Finally, however, we struck good collecting on a group of little ponds centering on Whites Pond. The discovery of such plants as *Lachnanthes tinctoria* (Walt.) Ell., *Xyris Smalliana* Nash, and *Panicum minutulum* Desv., although not constituting any extension of range is uncommon enough in this vicinity. The one noteworthy collection of the trip was *Utricularia subulata* L. forma *cleistogama* (Gray) Fernald, two small plants being found in a slough a few rods north of Whites Pond. So far as is known this is the first record in Massachusetts outside of Nantucket and Cape Cod. A little later Mr. Svenson found the *Utricularia* in fairly large numbers in shallow water on the muddy edge of Ezekiel Pond.

On October 14, we made a second trip to the southern Plymouth region, but worked more to the westward, collecting first at Fearings Pond. Here, just above the pond in the damp sand of a little spring, we found a single flowering specimen of the typical *Utricularia subulata*.—LYMAN B. SMITH, 1 Wolcott Terrace, Winchester, Mass.

TWO WEEDS NEW TO MILTON, MASSACHUSETTS.—There is little credit attached to introducing new weeds, but two plants unusual if not new hereabout have appeared in my garden last summer.

In May I found two plants of *Polemonium micranthum* Benth. growing among my hardy perennials. In June a few plants of *Madia sativa* Molina appeared on newly sown grass and to date perhaps twenty-five plants have come into flower on a half acre.

Both of these plants were beyond the range of my experience and of Gray's Manual, and I am indebted to Dr. Ivan M. Johnston for their determination. —NATHANIEL T. KIDDER, Milton, Massachusetts.

EXCEPTIONAL DIMENSIONS IN CORYDALIS SEMPERVIRENS.—Late in September, 1927, I collected at Winchendon, Massachusetts, a specimen of *Corydalis sempervirens* (L.) Pers. which is apparently the largest plant of the species on record. By careful measurement of a portion of the fresh plant, which I subsequently pressed, the height was 13.2 dm. and the cross section of the stem at its thickest point between nodes was 1.8 cm. in diameter. While motoring north from Winchendon toward Rindge along a new piece of State Road where a shallow cut had been made through moist red gravel, I saw several enormous plants growing among weeds. The largest, covered with pods and flowers in all stages of development, consisted of stout wide spreading branches, forming a hemispherical bush more than waist high. The largest specimens I find in the herbaria at Cambridge record nothing exceeding 6 dm. which is well under one-half the size of my plant. —R. J. EATON, Cambridge, Massachusetts.

Vol. 30, no. 350, including pages 1 to 20 and plate 158, was issued 11 February 1928.



N. C. Fassett del.

VARIETIES OF *BIDENS CONNATA*.

DUPLICATE BOOKS FOR SALE

- Hill, John.** The British Herbal: An History of Plants and Trees, natives of Britain, cultivated for use, or raised for beauty. 1756. Fol. 533 pp. With emblematic frontispiece and 75 plates containing hundreds of figures. Old tooled leather binding rubbed but still firm..... \$8.00
- Emerson, George B.** Report on the trees and shrubs growing naturally in the forests of Massachusetts. 8vo., 534 pp. 17 engraved plates. Boston, 1846. Unbound..... \$1.80
- Sullivant, W. S.** Icones Muscorum, 8vo., illustrated by numerous copper plates of high excellence (unbound and in sheets). Here offered at a greatly reduced price..... \$6.00
 Supplement to the preceding (also in sheets). \$5.00
 Icones and Supplement together..... \$10.00
- Watson, S.** Bibliographical Index to N. A. Botany. Part 1 (all published). Washington. 1878. 8° \$1.25

Address Librarian, GRAY HERBARIUM of HARVARD UNIVERSITY, Cambridge, Mass

INFORMATION WANTED about *Spiranthes ovalis*

I am very anxious to locate this orchid in its native habitat.

Records of stations with date and place; records of specimens in herbaria; any and all friendly suggestions, references or addresses which might help me to run down the living plant would be thoroughly appreciated.

EDWARD A. EAMES, 155 Bryant St., Buffalo, N. Y.

FIELD AND HERBARIUM EQUIPMENT

HAND LENSES	COLLECTING CASES	PLANT PRESSES
FERN TROWELS	MOUNTING PAPERS	GENUS COVERS
FIELD PICKS	HERBARIUM CASES	FELT DRIERS

Write for free Catalog R-91

CAMBRIDGE BOTANICAL SUPPLY CO., Waverley, Mass.